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Lactarius taxa by Zdeněk Schaefer – types and other collections in BRNM

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Abstract — Extant BRNM herbarium vouchers of *Lactarius* taxa described, validated, or neotypified by Zdeněk Schaefer are enumerated and discussed. For each taxon, the holotype, neotype, paratypes, syntypes, other original materials, and later collected specimens identified or revised by Schaefer are cited. The nomenclatural status of each taxon is evaluated and information or reference from published revisions/discussions is provided. These data represent an aid for future revisions by morphological-anatomic and molecular methods. The article follows a previous contribution devoted to vouchers in PRM.

Key words — *Basidiomycota*, *Russulales*, taxonomy, nomenclature, Europe

Introduction

Zdeněk Schaefer (1906–1974) was a Czech amateur mycologist who specialized in the genus *Lactarius*. He published more than 20 new taxa (species and varieties). Material studied by him is now stored in the Mycological Department of the National Museum in Prague (PRM) and Moravian Museum in Brno (BRNM). His biography, bibliography, working methods, and vouchers stored in PRM have been described by Holec et al. (2014).

Our intention here is to clarify which types, other original materials, and later collections identified by Schaefer are stored in BRNM. Most of the specimens have not been studied morphologically or molecularly. They should be used for clarification of the limits of Schaefer's new taxa and for future lecto- or neotypifications.

Materials & methods

Methods followed Holec et al. (2014). The following materials from BRNM are cited for each taxon (if extant): holotype, syntypes, paratypes, other original materials, and other collected specimens subsequently identified or revised by Z. Schaefer.

Taxonomic and nomenclatural terms are in accordance with the International Code of Nomenclature for algae, fungi, and plants (McNeill et al. 2012). Herbarium abbreviations follow Thiers (2013). The taxa are presented in alphabetical order. Taxonomic remarks are based on recent European *Lactarius* monographs (Bon 1980, Korhonen 1984, Heilmann-Clausen et al. 1998, Basso 1999, Kalamees 2011).

Results & discussions

Lactarius albocremeus Z. Schaef., Česká Mykologie 12: 211, 1958.

Latin diagnosis/description: Česká Mykologie 12: 211, 1958.

Detailed Czech description: Česká Mykologie 12: 208–209, 1958.

Holotype — designated. Slovakia, Western Carpathians, NNE of Poprad, between the villages of Spišská Belá and Lendak, site called „Blomwiesen", in fen meadow, close to *Betula* and *Salix* trees, alt. about 800 m, 11 Aug. 1957 leg. K. Kříž (BRNM 242123; see also Antonín & Vágner 1999).

Isotype — PRM 584029 (for details see Holec et al. 2014).

Nomenclatural status — valid, legitimate.

Taxonomic remarks — see Holec et al. (2014).

Lactarius chrysophyllus Z. Schaef., Česká Mykologie 11: 52, 1957.

Latin diagnosis/description: Česká Mykologie 11: 52–53, 1957.

Detailed Czech description: Česká Mykologie 11: 50–52, 1957.

Holotype — not designated.

Syntypes — Czech Republic, Moravia, Kuřim, on a slope Na pískách, on a grassy and mossy soil in a *Picea* and *Quercus* forest, alt. 350 m, 12 Nov. 1945 leg. F. Šmarda (BRNM 243022, as *L. pyrogalus*); Tišnov, in a Rovinky forest near Heroltice, on soil in *Carpinus* forest, 15 July 1944 leg. F. Šmarda (BRNM 243020, as *L. pyrogalus*).

Nomenclatural status — valid, legitimate.

Taxonomic remarks — Bon (1980) considered *L. chrysophyllus* a separate species within sect. *Glutinosi*, subsect. *Vietini*, stirps *Vietus*. Basso (1999: 138, 143–144) considered *L. chrysophyllus* a synonym of *L. hysginus* (Fr.) Fr.

Lactarius cookei Z. Schaef., Česká Mykologie 14: 236, 1960.

Latin diagnosis/description: Česká Mykologie 14: 236–237.

Detailed Czech description: Česká Mykologie 14: 230–232.

Holotype — designated. Slovakia, Western Carpathians, E margin of High Tatra Mts., NNW of Kežmarok, close to the village of Lendak, pasture near a forest, under isolated *Picea abies* trees, Tertiary flysh bedrock, alt. about 800 m, 11 Aug. 1957 leg. J. Kubička et K. Kříž. Nonexistent.

Later collections identified by Schaefer — **CZECH REPUBLIC**, **Moravia**, Herálec near Svratka, autochthonous *Picea* forest (*Abieto-Piceetum sphagnetum*), 16 Sep. 1965 leg. F. Šmarda (BRNM 242330).

Nomenclatural status — valid, legitimate.

Taxonomic remarks — species of unclear identity. Bon (1980) considered *L. cookei* a good species of sect. *Plinthogali*, subsect. *Ruginosi* (together with *L. pterosporus* Romagn., *L. subruginosus* J. Blum ex Bon, *L. ruginosus* Romagn., and *L. terenopus* Romagn.). For a brief discussion see Basso (1999: 689–690), who compared the species with *L. picinus* Fr. and *L. romagnesii* Bon.

Lactarius cupricolor Z. Schaef., Česká Mykologie 20: 158, 1966.

Latin diagnosis/description: Česká Mykologie 20: 158, 1966.

Detailed Czech description: Česká Mykologie 20: 154–156, 1966.

Detailed German description: Česká Mykologie 20: 156–157, 1966.

Holotype — designated (PRM 584026; see Holec et al. 2014).

Paratypes — Czech Republic, central Bohemia, Praha, Divoká Šárka, *Quercus* forest, 7 Sep. 1937 leg. J. Herink (BRNM 325878); Moravia, Lipůvka near Brno, Dubová hora hill, alt. 570 m, herb-rich *Fagus* forest, 14 Aug. 1961 leg. F. Šmarda (BRNM 242353; the date 14 Aug. 1960 was published by Schaefer as it was originally written on the herbarium label; however, later it was corrected to 1961 by Šmarda). There are two other paratypes in PRM (Holec et al. 2014).

Later collections identified by Schaefer — **Czech Republic, Moravia**, Litenčické vrchy Mts., Kunkovice, Kunkovický les forest, alt. c. 280 m, under *Carpinus* in a *Quercus*, *Carpinus*, *Tilia*, and *Betula* stand, 6 Sep. 1968 leg. K. Kříž (BRNM 686362); Lelekovice, Babí lom forest, a place called Líchy, 29 June 1952 leg. F. Šmarda (BRNM 242354); Kuřim, Čebínka hill, *Quercus-Carpinus* forest, 20 June 1951 leg. F. Šmarda (BRNM 242351); Ždánický les hills, Ždánice, a place called U slepice, herb-poor *Fagus* forest (*Fagetum pauper*), 11 Sep. 1966 leg F. Šmarda et al. (BRNM 243031).

Nomenclatural status — valid, legitimate.

Taxonomic remarks — species of unclear identity. Bon (1980) considered *L. cupricolor* a separate species of sect. *Glutinosi*, subsect. *Vietini*, stirps *Glutinopallens*. Basso (1999: 131–132) placed it under *L. vietus* (Fr.) Fr. but also compared it with *L. pallidus* Pers.

Lactarius hortensis* var. *olivaceus Z. Schaef., Česká Mykologie 26: 143, 1972.

Latin diagnosis by Schaefer: Česká Mykologie 26: 143.

Original Czech diagnosis: Česká Mykologie 26: 143.

Holotype — designated. Czech Republic, Moravia, N of Brno, Kuřim, in a garden under *Corylus avellana*, 25 Aug. 1968, leg. K. Kříž (BRNM). [The label of BRNM 243701 agrees with the protologue designation in every detail except the collector's name, which is given as H. Vališ. Despite this discrepancy, BRNM 243701 is almost certainly the holotype.]

Nomenclatural status — valid, legitimate.

Taxonomic remarks — Schaefer (1972) considered *L. hortensis* Velen. a very variable species. His var. *olivaceus* represents a taxon with an olivaceous tinged pileus, soon brightly yellow or orange lamellae, and growing on acid substrates.

Bon (1980) considered it a separate taxon, which he erroneously cited as "var. *olivascens*." Basso (1999: 117, 123) considered it synonymous with *L. pyrogalus* (Bull.) Fr.

Lactarius hortensis* var. *tephroleucus Z. Schaef., Česká Mykologie 26: 143, 1972.

Latin diagnosis by Schaefer: Česká Mykologie 26: 143.

Original Czech diagnosis: Česká Mykologie 26: 143.

Holotype — designated. Czech Republic, Moravia, Veverská Bítýška, in stand of *Corylus avellana*, 19 Aug. 1957 leg. K. Kříž et Z. Schaefer (BRNM). [Although Schaefer (1972) stated that the specimen was preserved in BRNM, it was not found there.]

Nomenclatural status — valid, legitimate.

Taxonomic remarks — According to Schaefer (1972), this variety represents a small fungus with an opaque, variably grey coloured pileus, broad lamellae, an incarnate-ferrugineous tinged stipe cuticle, and rather narrow stipe growing under *Corylus avellana* on basic substrates in rather warm conditions. Bon (1980) mentioned it only in brackets as a small thermophilic calcicolous variety. Basso (1999: 117, 123) considered it synonymous with *L. pyrogalus*.

Lactarius pearsonii Z. Schaef., Česká Mykologie 22: 19, 1968.

= *Lactarius mairei* var. *zonatus* A. Pearson, Naturalist, London: 100, 1950.

Latin description: Česká Mykologie 22: 19, 1968.

Czech discussion: Česká Mykologie 22: 17, 1968. Detailed Czech description cited by Schaefer (1968: 17) was published by Pouzar (1954: 40–41, as "*L. aurantiacoochraceus*").

Holotype — designated (PRM 193531; see Holec et al. 2014).

Other original materials (all identified as *L. pearsonii* but cited only by locality names in the protologue) — **CZECH REPUBLIC**, **Moravia**, Brno, Hády, in a broadleaved forest (*Quercus*, *Carpinus betulus*), 19 Aug. 1972 leg. A. Vágner (BRNM 686364); Brno, Hády, under *Quercus* in a broadleaved forest, 6 Aug. 1972 leg. A. Vágner (BRNM 686363); Dolní Věstonice, Děvičky, alt. 320 m, an *Quercus-Carpinus* forest with intermixed *Fraxinus* and *Tilia* (*Querceto-Carpinetum fraxino-tillietosum*), 9 July 1963 leg. F. Šmarda (BRNM 242932); Starý Poddvorov near Hodonín, Horní Kapansko forest, alt. 250 m, thermophilic *Quercus* forest (*Querceto-Potentilletum albae*), 24 June 1962 leg. K. Koncerová (BRNM 242933). [Although, the determiner is not noted for the last three specimens, the fungus name is written in Schaefer's handwriting.] There are two more collections in PRM (Holec et al. 2014).

Nomenclatural status — valid, legitimate.

Taxonomic remarks — Bon (1980) mentioned *L. pearsonii* as a synonym of *L. mairei* var. *zonatus*. For a synopsis of other published discussions and revisions that show *L. pearsonii* as synonymous with *L. mairei* Malençon, see Holec et al. (2014).

Lactarius pinicola Smotl. ex Z. Schaef., Schweizerische Zeitschrift für Pilzkunde 48: 141, 1970.

"*Lactarius deliciosus* var. *pinicola*" Smotlacha, Atlas hub jedlých a nejedlých [Atlas of edible and inedible fungi]: 219, 1947, nom. inval. [no Latin description].

Latin diagnosis: Schaefer (1970: 141–142).

German discussion: Schaefer (1970: 139–142).

Holotype — designated (PRM 584024; see Holec et al. 2014).

Other collections identified by Schaefer — **CZECH REPUBLIC**, **Moravia**, Kuřim, Bělč forest, *Quercus* forest, alt. 320 m, 31 Aug. 1960 leg. et det. F. Šmarda as *L. salmonicolor*, rev. Z. Schaefer (BRNM 326197); in mosses (*Hypnum schreberi*) in mixed forest (*Picea*, *Quercus*, *Betula*), 13 Oct. 1953 leg. J. Herink et F. Šmarda, det. J. Herink as *L. subsalmoneus*, rev. Z. Schaefer (BRNM 326196); Hluk, Kobylí hlava steppe slope, *Betula*, *Quercus*, admixed *Pinus*, Sep. 1969 leg. J. Hubáček (BRNM 326198); Kuřim, Šiberná forest, alt. 350 m, thermophilic *Quercus* forest with *Potentilla alba* (*Querceto-Potentilletum albae*), 6 Aug. 1961 leg. F. Šmarda (BRNM 242948, 242951); *Quercus* forest with *Pinus sylvestris*, 18 Aug. 1964 leg. F. Šmarda (BRNM 242949); Ždánický les hills, Zdravá Voda near Žarošice, Lísov forest, *Quercus-Carpinus* forest with *Poa nemoralis* (*Querceto-Carpinetum poetosum nemoralis*), alt. 350 m, 4 Sep. 1963 leg. F. Šmarda (BRNM 242950). [In the last four specimens, the determiner is not stated; however, the fungus name is written in Schaefer's handwriting.]

Nomenclatural status — valid, legitimate.

Taxonomic remarks — synonymous with *L. deliciosus* (L.) Gray (for synopsis of published discussions and revisions, see Holec et al. 2014).

Lactarius pyrogalus* var. *polyzonus (Velen.) Z. Schaef., Česká Mykologie 26: 144, 1972.

≡ *Lactarius polyzonus* Velen., České houby [Czech fungi], part 1: 163, 1920.

Latin diagnosis: Česká Mykologie 26: 144.

Czech discussion: Česká Mykologie 26: 144.

Holotype — designated. Czech Republic, Praha-Radotín, near the village of Kosoř, thermophilous grove composed of deciduous trees, Aug. 1918 (Velenovský 1920: 163). Nonexistent (Holec & Suková 2007).

Neotype — Czech Republic, southern Moravia, near the village of Dolní Věstonice, Pálava (= Pavlovské vrchy) hills, near the castle ruins of Děvičky, *Acer-Fraxinus* forest, 19 Aug. 1955 leg. F. Šmarda et Z. Schaefer (BRNM), designated by Schaefer (1972: 144). [The specimen BRNM 242310, labelled by Schaefer as "*L. carpinetorum* = *L. circellatus*", probably represents the neotype as it is the only BRNM specimen from this *Lactarius* group that agrees with Schaefer's neotype designation.]

Nomenclatural status — valid, legitimate.

Taxonomic remarks — taxonomic value of this variety is unclear. Bon (1980) included it as a separate taxon in his key, while Basso (1999: 123–124) discussed it under *L. pyrogalus*.

Lactarius pyrogalus* var. *umbrosus Z. Schaef., Česká Mykologie 26: 145, 1972.

Czech and Latin diagnoses: Česká Mykologie 26: 145, 1972.

Holotype — designated (for details see Holec et al. 2014). Nonexistent, probably discarded by Schaefer's family.

Other collections identified by Schaefer — **CZECH REPUBLIC**, **Moravia**, Ždánický les hills, Zdravá Voda near Žarošice, forest with dominating *Carpinus*, mixed with *Tilia* and *Quercus* (*Querceto-Carpinetum caricetosum pilosae*), alt. 390 m, 22 Aug. 1961 leg. F. Šmarda, det. Z. Schaefer as *L. adscitus* (BRNM 325705). Schaefer (1972) mentioned the identity of *L. pyrogalus* var. *umbrosus* with *L. adscitus*. Therefore, the specimen certainly represents his new variety.

Nomenclatural status — valid, legitimate.

Taxonomic remarks — taxonomic value of this variety is unclear. Bon (1980) cited it only in brackets, and Basso (1999: 124) discussed it under *L. pyrogalus*.

"***Lactarius russuloides***" Z. Schaef., Česká Mykologie 12: 205, 1958, nom. inval.

Latin diagnosis/description: none.

Detailed Czech description: Česká Mykologie 12: 205–206, 1958.

Holotype — not designated

Other original materials — **CZECH REPUBLIC**, **Moravia**, Telč, Hulišťata forest, in mosses and humus in *Vaccinium myrtillus* under *Pinus*, alt. c. 600 m, 23 Aug. 1957 leg. Z. Schaefer (BRNM 242887, as *L. musteus*).

Other collections identified or revised by Schaefer — **CZECH REPUBLIC**, **Moravia**, Rozdrojovice, mixed forest (*Quercus*, *Pinus*), 29 Oct. 1967 leg. K. Koncerová (BRNM 326356).

Nomenclatural status — invalid: lacking Latin description or diagnosis and holotype designation. For details see Holec et al. (2014).

Taxonomic remarks — Basso (1999: 171, 175) considered "*L. russuloides*" synonymous with *L. musteus* Fr.

Lactarius subtomentosus Z. Schaef., Česká Mykologie 14: 237, 1960, nom. illegit., non Berk. & Ravenel 1859.

Latin diagnosis/description: Česká Mykologie 14: 237.

Detailed Czech description: Česká Mykologie 14: 235–236.

Holotype — designated. Slovakia, central Slovakia, Zvolen district, Sliač spa, pasture at margin of a *Picea abies* forest, 23 Nov. 1958 leg. K. Kříž. [According to Schaefer (1960), it was preserved in herbarium "Fungi Moravici Brno" which is most probably the personal herbarium of František Šmarda, later transferred to BRNM. However, the collection was not found in BRNM.]

Nomenclatural status — valid, illegitimate (a later homonym of *L. subtomentosus* Berk. & Ravenel 1859; and superfluous [synonymised with *L. tomentosus* Cooke 1883]).

Taxonomic remarks — Schaefer (1960) himself stated that his new species was synonymous with "*Lactarius tomentosus* sensu Cooke." However, as *L. tomentosus* Cooke is accepted as a legitimate name (a nom. nov. based on the illegitimate *Agaricus tomentosus* J. Otto), *L. subtomentosus* is a superfluous name and therefore illegitimate (ICN Art. 52.2(e)).

Bon considered *L. subtomentosus* Z. Schaef. synonymous with *L. tomentosus* Cooke. Basso (1999: 474) discussed the species under *L. helvus* (Fr.) Fr.

Lactarius syringinus Z. Schaef., Česká Mykologie 10: 171, 1956.

Latin diagnosis/description: Česká Mykologie 10: 171–172, 1956.

Detailed Czech description: Česká Mykologie 10: 168–171, 1956.

Holotype — designated. Currently nonexistent, probably not preserved by Schaefer (for details see Holec et al. 2014).

Other collections identified by Schaefer — **CZECH REPUBLIC, eastern Bohemia**, Telecí, 27 Sep. 1963 leg. E. Horníček (BRNM 243323). [The determiner is not stated on the label; however, the fungus name is written in Schaefer's handwriting.]

Nomenclatural status — valid, legitimate.

Taxonomic remarks — Bon (1980) mentioned it only in brackets together with *L. vietus*. For a synopsis of other published discussions and revisions that show that *L. syringinus* is either a good species or, more probably, a synonym of *L. vietus*, see Holec et al. (2014).

Lactarius tatrorum Z. Schaef., Česká Mykologie 12: 211, 1958.

Latin diagnosis/description: Česká Mykologie 12: 211–212.

Detailed Czech description: Česká Mykologie 12: 209–210.

Holotype — designated. Slovakia, Western Carpathians, High Tatra Mts.: Belanské Tatry group, E slope of Mt. Bujačí, under *Salix reticulata*, *Pinus mugo*, *Dryas octopetala*, and *Carex tatrorum*, on calcareous bedrock, alt. 1800–1940 m, 14 Aug. 1957 leg. J. Kubička et K. Kříž (BRNM 243369).

Nomenclatural status — valid, legitimate.

Taxonomic remarks — synonymous with *Lactarius nanus* J. Favre (Basso 1999: 144, 148).

Conclusions

The inventory of BRNM voucher specimens of *Lactarius* taxa described by Schaefer showed that eight nomenclaturally important collections are extant (three holotypes, two paratypes, two syntypes, one neotype) together with five other original collections. They should be studied by morphological-anatomic and molecular methods, as some may represent good species, and all provide a good basis for future revisions and typifications by *Lactarius* monographers.

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